Ministry of
Forests and Lands

British Columbia Forest Service

Internal attitude survey on pesticide use

June 1987

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B.C. Forest Service

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PREFACE

The Forestry Issues Steering Committee (FISC) was formed in 1985 to assist the B.C. Forest Service by providing information concerning the use and regulation of pesticides in forest management. In our forests, herbicides are used to control undesirable vegetation and insecticides are applied primarily to combat infestations of defoliating insects.

Although pesticide use in B.C. forestry is minor when compared with use in agriculture, around homes, or in other parts of Canada, significant confrontation has occurred here periodically during the past decade. Much of this controversy has resulted from misunderstanding, poor communication, and positions based - at least in part - on strong views and opinions established prior to rational discussion of B.C.'s forest pest problems.

As forestry operations in B.C. develop and intensify, it is paramount that the Forest Service acquires the support of its shareholders - the people of B.C. - in all of its forest management activities. This is particularly important for our program of careful and controlled pesticide use. Thus, an important first step in developing understanding and support was to seek the advice and comment of Forest Service staff across the province.

This report summarizes the results of the survey conducted in 1986 by Ministry staff and input by professional management consultants. I believe the results are an accurate and fair representation of the current situation. Clearly, FISC must now review these recommendations, discuss all possible opportunities and initiatives, and assist in vigorous new efforts to explain and inform about pesticide use. We are particularly grateful to all Forest Service staff for their participation and for their candid remarks which will guide the committee in this work.

At the same time, I invite readers of this report to send me their additional ideas, suggestions, and comments regarding the use of pesticides and their regulation in forest management.

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April 7, 1987

Dr. R. DeBoo,
Member, Forestry Issues Steering Committee,
c/o Protection Branch,
Ministry of Forests and Lands,
1450 Government Street,
Victoria, B.C.,
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Dear Dr. DeBoo:

We are pleased to present our report on the collective attitude of B.C. Forest Service employees towards the use of pesticides in British Columbia.

The originial research for the survey was conducted by the Forest Service in 1986 under the direction of the Forestry Issues Steering Committee. This included questionnaire design, sample selection, data collection, data compilation and initial analysis. Price Waterhouse was then engaged by the Committee to independently review, analyse and interpret the survey results and to prepare this report.

The cooperation and assistance of the members of the Forestry Issues Steering Committee is gratefully acknowledged.

Yours very truly,

C. F. JONES, CA, MBA, CMC,
Director, Management Consulting Services

EXECUTIVE SUMMARY

The survey questionnaire was completed in 1986 by 880 of the 1,300 employees of the Forest Service whose opinions were solicited. The raw survey data were compiled and summarized by BCFS. Price Waterhouse, an independent firm of management consultants with extensive forest sector experience, were engaged to review the survey data, draw objective conclusions from it and prepare this report of their findings.

The key findings of the survey are:

- BCFS employees were generally comfortable with the use of pesticides (including herbicides) when applied according to instructions and subject to regulations. Most staff understand and respect the right of BCFS to use pesticides in appropriate circumstances. As a forest management option, the benefits from the cautious use of pesticides are felt to outweigh their costs.

- The current capability of BCFS in the application of pesticides is felt to be good. Most respondents felt that this capability exceeded that of the private sector. Basic training in application is good but there exists a need for more extensive upgrading and refresher courses to be made available.

- Respondents were critical of BCFS efforts to explain its forest management practices to the public. There appears to exist a rather defensive attitude on the part of many respondents because they feel that BCFS has not been effective in explaining the reasons for its use of pesticides, especially herbicides. A pro-active stance is recommended, employing the greater use of public information programs and professional media campaigns. In particular, respondents felt that:

  - the public should be more directly involved in pesticide issues;
  - the public has a right to know more about what is being done to their environment;
  - BCFS should take the time and effort to educate the public on the benefits of pesticide use (and the potential risks), even if it slows down Ministry activities; and
  - the public should be advised about pesticide use even where all the legal requirements are clearly met.

1.0 INTRODUCTION

In July 1986, the British Columbia Forest Service (BCFS) distributed a questionnaire on pesticide usage to about 1,300 employees. 880 completed responses were received. Quantitative data was tabulated and summarized by the BCFS and qualitative information ("write-in comments") was recorded verbatim, in typewritten format.

Price Waterhouse was engaged to review the quantitative and qualitative data gathered and processed by the BCFS and to prepare a summary of the results in order to interpret the collective attitude of BCFS employees towards pesticide use.

PARTICIPANTS

The survey was distributed to a wide range of employee groups in various geographic locations. The respondent groups are depicted in Exhibit 1, which also defines the regional and occupational groups used in the survey.

While we did not review the coverage provided by the survey, we understand that the ministry is satisfied that the regional and occupational distribution of the questionnaire response was reasonably representative of BCFS as a whole.

DEFINITION OF TERM

"Pesticide" is an all-encompassing legal term which covers a wide range of control agents. It may be a bleach, a bird repellant or even a virus. Most pesticides are chemicals. Chemical pesticides can be divided according to their use - insecticides, fungicides and herbicides are used to control insects, fungi and plants respectively. In this report, the term pesticide is used in this generic sense and not to refer to any specific agent or function.

BRITISH COLUMBIA FOREST SERVICE
PESTICIDE ATTITUDE SURVEY

RESPONDENT GROUPS

REGIONAL GROUPINGS

	Number of Respondents	% of Total
1. Lower Mainland and Vancouver Island (includes Vancouver forest region and Victoria branch offices)	275	31%
2. Southern Interior (includes Cariboo, Kamloops and Nelson forest regions)	367	42%
3. Northern B.C. (includes Prince George and Prince Rupert forest regions)	238	27%
	880	100%

OCCUPATIONAL GROUPINGS

	Number of Respondents				
	Region 1	Region 2	Region 3	Total	% of Total
1. Management	50	59	44	153	17%
2. Professional	38	90	62	190	22%
3. Technical	120	178	99	397	45%
4. Non-technical	39	34	27	100	11%
4. Nursery Technicians	28	6	6	40	5%
	275	367	238	880	100%

ANALYTICAL APPROACH

The questionnaire contained two types of question:

- "Quantitative" questions, where respondents checked a box which most closely represented their answer or attitude, and
- "Qualitative" questions where respondents were requested to write in comments related to the issues discussed in the preceding questions.

The responses to the quantitative questions were processed and compiled by BCFS and summarized in a series of reports which enumerated the percentage response to each question. Analyses by region and employee category were also performed. The responses to the qualitative questions were processed by BCFS on a word processing system and resulted in 156 pages of typed comments.

We conducted the analysis of the BCFS data as follows:

Quantitative data

We reviewed the collected data for each question and summarized it in questionnaire summary form. We then examined the sub analyses (regions and occupational groupings) for responses which varied significantly from the norm. Variances in responses of $\pm$10% were considered significant. Where these variances existed, the appropriate sub-analyses were tabulated on an exception basis.

Qualitative Data

The "write-in" comments resided on the ministry's word processing system, and could not be further sorted automatically without an extensive keyboard intervention and re-compiling. We therefore sorted the comments by reformatting the responses by question number, using "key phrase" analysis to interpret and categorize response themes. We then reviewed the number of responses to provide an indication of the level of support for each theme. No attempt was made to analyze the qualitative data by region or occupational grouping.

RESERVATIONS ON THE SURVEY RESULTS

In reviewing the results of the survey, the following reservations should be borne in mind:

a. The largest single group of respondents were technical staff and the overall results are quite heavily weighted towards their opinions. Where exceptions occurred in the data, they tended to relate to the other employee groups included in the survey, since technical staff responses usually related closely to the overall average response.

b. The survey design and methodology ensured that equal weight was given to each respondent regardless of his/her level of familiarity with the subject matter or level of knowledge of pesticides and their use. While helpful to obtain a broad indication of employee attitudes as individuals, the survey was not designed to reflect the opinion of knowledgeable people as experts in the use of pesticides.

c. Because all respondents were asked to answer each question, there was no means of distinguishing the responses of those who answered knowledgeably from those who answered on the basis of hearsay or general impression. Use of the results to determine policy on the

use of pesticides is not recommended except in the most general sense.

Because not every respondent answered each question, the total percentage responses do not always sum to 100%.

REPORT STRUCTURE

The questionnaire was divided into four sections, as follows:

A. Personal
B. Forestry Management Practices
C. Public Involvement
D. Current (BCFS) Capability

The questionnaire contained three questions requesting write-in comments:

- Section A, Question 3, referring to the safety of commercial foods after washing;
- Section B, Question 9, referring to suggestions for improvements in forestry management practices; and
- Section D, Question 17, asking for general comments.

The following chapters contain a summary of the results of our observations on each question included in Sections A to D.

Each chapter concludes with a summary of the general conclusions relating to the topic covered.

2.0 SECTION A - PERSONAL ATTITUDES

1. Do you, or does anyone in your household, use any of these pesticides at home?

Response

	Yes	No
a) Herbicides: used for weed control	53%	44%
b) Insecticides: used for insect control	54%	45%
c) Fungicides	11%	81%
d) Chemical rodent control	8%	84%
e) Other (please specify)	3%	97%

Note:

- The questionnaire asked for one of four responses - regular use, occasional, hardly ever, and never. BCFS grouped the responses as shown above.

Comment

- Regional responses did not vary from overall responses.
- Management and professional staff tended to be higher users than other categories.

2. Which of the following foods from each of these sources do you feel contain pesticide residue?

Response

	From Grocery Chain	From Farmers' Markets	From Health Food Stores	Grown at Home
a) Fruits and vegetables	91%	80%	33%	23%
b) Breads and cereals	65%	48%	30%	12%
c) Meat and poultry	67%	53%	24%	15%
d) Dairy products	64%	52%	27%	15%

Comment

- Use of pesticides appears to the respondents to increase with degree of separation from consumer.

- Regional results were generally consistent with provincial results.

- Occupational group responses varied within regions.

  Region 1
  - managers expressed less concern than average
  - professionals expressed more concern

  Regions 2 & 3
  - non-technical staff expressed less concern in Region 2 and more in Region 3
  - nursery and non-technical staff showed greater concern in both regions

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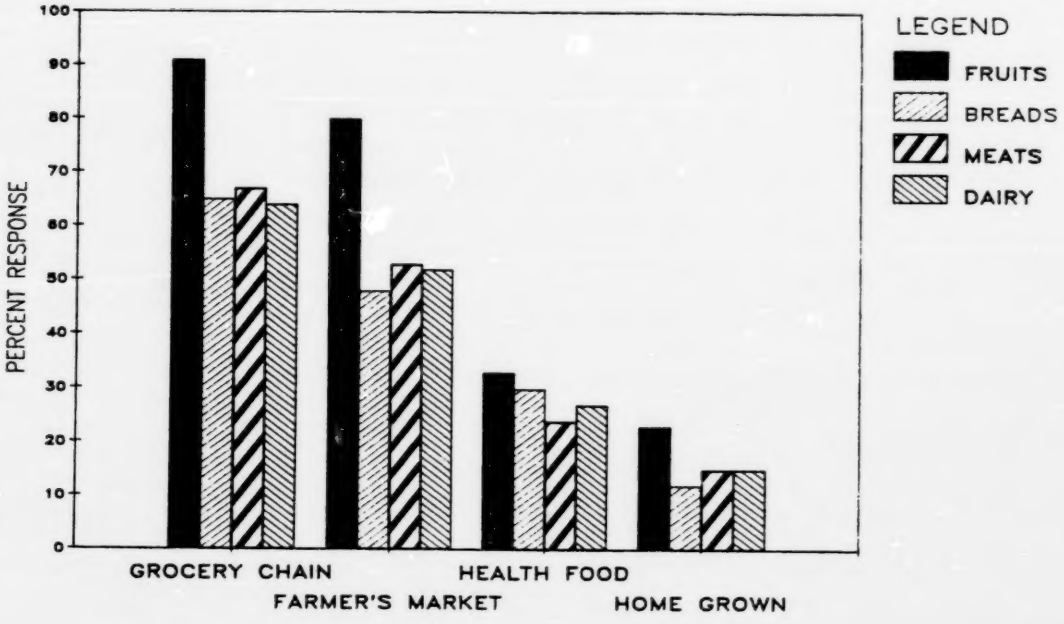
PESTICIDE ATTITUDE SURVEY

Q.2: WHICH OF THE FOLLOWING FOODS FROM EACH OF THESE SOURCES DO YOU FEEL CONTAIN PESTICIDE RESIDUE?



3. **Do you feel that commercial foods, grown using pesticides, are safe to eat <u>after being washed?</u>**

Response

Always	Usually Safe	Usually Not Safe	Never Safe
12%	75%	8%	4%

Themes from Respondents' write-in comments

	# of Mentions	% of Total Response (880)
Pesticide Toxicity Themes		
. Concern expressed about the cumulative effects of pesticides and safe dosage levels	38	4%
. Level of safety depends on type of pesticide, care in application, and time since spraying	31	4%
. Suspicion that some pesticide finds its way into fruits and vegetables through the roots, leaves and skin (but not generally considered harmful).	22	3%
Regulatory System Themes		
. Products generally considered safe if washed properly. No real choice but to have faith in the regulations and inspection system.	61	7%
. Don't trust chemicals on food. Too little control of application.	33	4%
. Have faith in the North American regulatory system but suspicious of products from offshore.	5	1%

Comment

- Written comments to this question focussed on two main issues, **pesticide toxicity** and the **regulatory system.**

- Comments on pesticide toxicity were divided into two main themes. 38 comments (or 4% of possible respondents) expressed concern about the unknown cumulative effects of pesticides and 22 comments (3%) were made that even though washing probably doesn't remove all the pesticide, the residue is probably not harmful.

- Comments on the regulatory system were again divided. 61 comments (7%) expressed faith in the regulatory system and/or noted that there was little choice but to purchase commercially grown products, while 33 comments (4%) indicated that there is too little control over pesticide applicators and commercially grown food products are not to be trusted.

- While there is some suspicion about the safety and amount of chemicals applied to commercially grown food products, the convenience factor outweighs the possible risks.

- Average regional results did not vary significantly from the provincial average.

- Management staff in Regions 1 and 3 showed a higher degree of confidence in the safety of washed commercial foods, while non-technical staff in Regions 1 and 3 showed less than average confidence.

4. Were you aware that the use of pesticides in Canada and in British Columbia is regulated?

Response

Yes	No
99%	1%

5. Do you feel that these Federal/Provincial regulations are adequate for public safety?

Response	Quite Adequate	Somewhat Inadequate
a) Regulations for use on agricultural lands	52%	45%
b) Regulations for use on forest lands	79%	18%
c) Regulations for use in homes and gardens	39%	58%

Note:

- The questionnaire requested the following responses
  - Quite adequate, somewhat adequate, somewhat inadequate, not adequate at all. BCFS summarized the response as above.

Comment

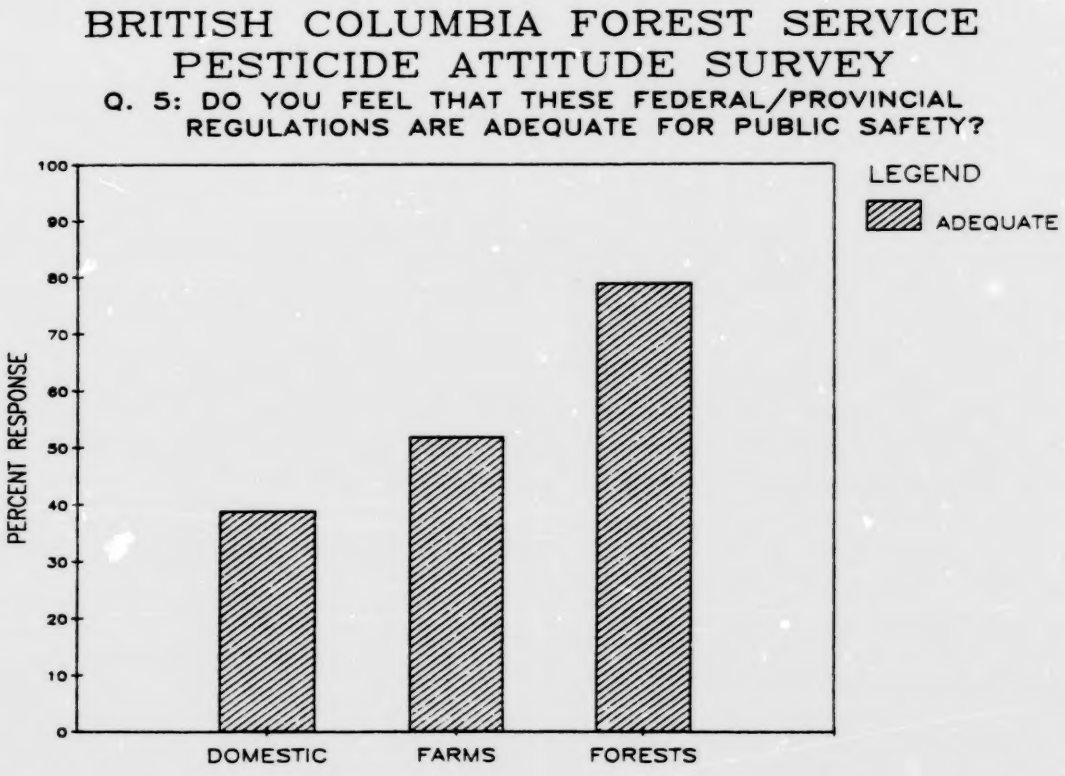
- Responses showed a definite trend towards increased confidence in the effectiveness of regulations in maintaining public safety, as the location moves away from the home toward the farms and forests.

- It is not clear whether this indicates confidence in regulations or decreased familiarity (and thus knowledge) of potential abuses as applications move farther afield. It may also reflect decreased concern for events as they become more remote.

- The majority of employees (79%) agree that forestry applications are well regulated.

- Average regional results did not vary significantly from the provincial average.

- Variances across employee groups are mixed. In all three regions there was a relatively high non-response rate from non-technical employees (10%), probably indicating a lack of knowledge in this subject area.



6. **How would you rate your familiarity with the label restrictions for use of the following pesticides?**

Response

	Very Familiar	Would Need to Refresh My Memory	Unfamiliar Would Need to Study Carefully	Totally Unfamiliar
a) TORDON	10%	38%	33%	18%
b) ROUNDUP	28%	42%	20%	10%
c) 2,4-D	20%	46%	23%	11%

Comment

- The majority of responses (38 - 46%) were in the "would need to refresh my memory" category, for all three pesticides listed. Only 10% to 28% of the respondents indicated that they were "very familiar" with the selected pesticides. Respondents were more familiar with Roundup that Tordon or 2,4-D.

- Average regional results did not vary significantly from the provincial average.

- In all three regions, nursery staff exhibited greater familiarity with pesticides than average, while non-technical staff were less familiar. Professional staff in Region 1 indicated greater than average familiarity with 2, 4-D.

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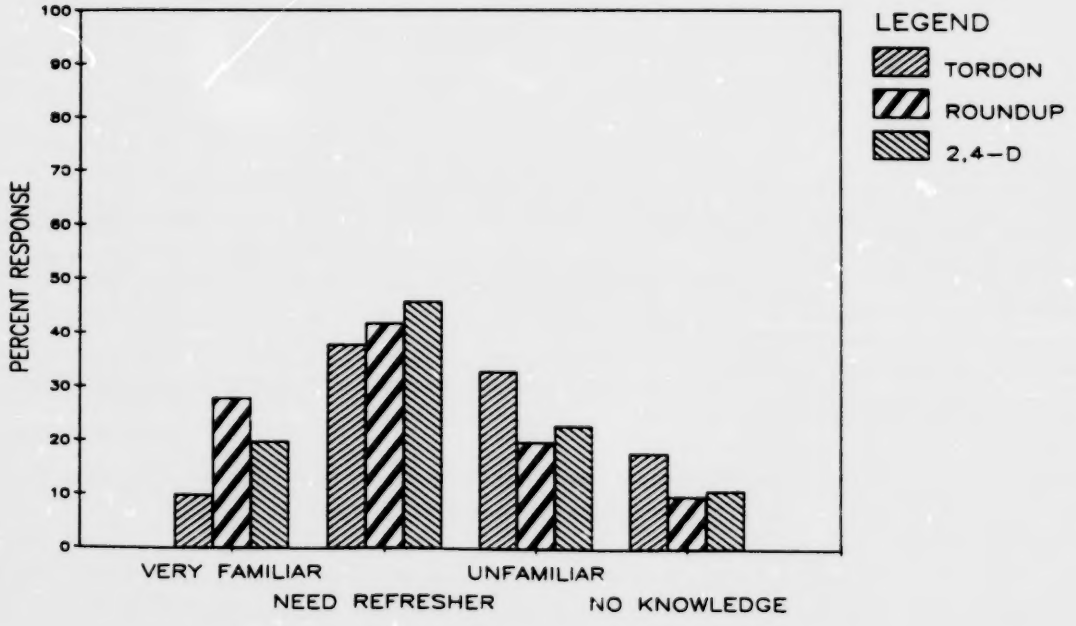
Q. 6: HOW WOULD YOU RATE YOUR FAMILIARITY WITH THE LABEL RESTRICTIONS FOR USE OF THE FOLLOWING PESTICIDES?



7. Which response best describes the way you feel about the use of government-approved herbicides <u>according to labelled instructions</u> for vegetation control?

Response

	Can Be Used With No Harmful Side Effects	Can Be Used, But With Special Care	Should Only Be Used When Absolutely Necessary	Should Never Be Used
a) in parks & public recreation areas	6%	36%	43%	14%
b) on game reserves	11%	35%	36%	16%
c) in forests	23%	51%	23%	2%
d) in rivers & lakes	3%	15%	40%	41%
e) on agricultural croplands	10%	53%	30%	6%
f) on private lawns & gardens	12%	51%	30%	7%
g) on household plants	13%	43%	30%	13%
h) on home vegetable gardens	7%	35%	40%	17%
i) commercial nurseries	16%	55%	25%	3%

Comment

- Responses to the four statements were sharply divided depending upon the location of the herbicide application. Generally, less than 15% of respondents felt that herbicides "can be used with no harmful side effects", except in forests, where 23% felt there would be no harm.

- The majority opinion in most cases (35% - 55%), was that herbicides "can be used, but with special care".

- The exception was applications in rivers and lakes, where only 15% said herbicides could be used with special care.

- A somewhat smaller group chose the statement that herbicides "should only be used when absolutely necessary" (23% - 43%).

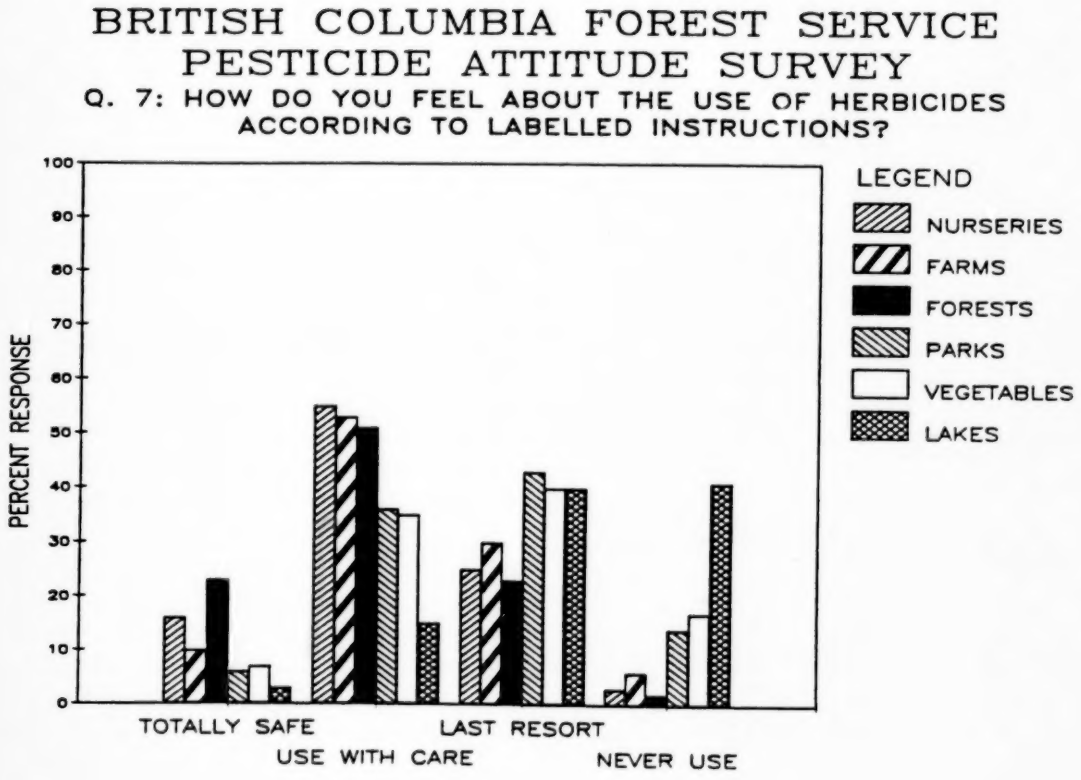
- Rivers and lakes received the largest vote for "should never be used" (41%), while the least concern was shown for forests (2%).

- Respondents were more concerned about the use of herbicides in rivers and lakes than on home vegetable gardens. This presumably relates to a feeling of increased control over herbicide use in the domestic environment.

- The disparity in responses by location indicates that BCFS employees have some real concerns about the safety of herbicides, especially in sensitive environments. Many of the sites which employees feel have a greater sensitivity to herbicides (e.g. parks, game reserves, rivers and lakes) are often an integral part of the forests, indicating a significant potential for conflict and a consequent need for careful prescription.

- Average regional results did not vary significantly from the provincial average.

- Variations from the average were quite frequent across occupational groups. The trend among management and professional staff was toward greater faith in the safety of herbicides while the opposite was true for non-technical staff. Region 1 showed the greatest difference of opinion between management and non-technical staff.



GENERAL CONCLUSIONS ABOUT PERSONAL ATTITUDES

This section included seven questions addressing employee attitudes towards the use and safety of pesticides, as well as their familiarity with regulations and application procedures.

- Employees are split 55%/45% between users and non-users respectively of herbicides and insecticides, and are negligible users of other chemicals.

- Employee concern for residue on food products appear to increase with the distance or "detachment" from the source.

- Most employees feel that commercially grown foods are safe after washing, although some concern was expressed about the cumulative effects of pesticides.

- Virtually all employees are aware that pesticide use is regulated.

- The majority of employees feel that forestry applications are better regulated than agriculture and homes and gardens.

- Less than one-quarter of employees are thoroughly familiar with pesticide label restrictions, with the majority requiring a refresher.

- Employees are more comfortable with the use of herbicides in forests and commercial nurseries, than with their use in public parks or rivers and lakes. This might indicate a significant potential for conflict.

3.0 SECTION B - FORESTRY MANAGEMENT PRACTICES

Note:

As questions 8 and 10 dealt with the same issues for the Ministry (Q.8) and the industry (Q.10), they are discussed together in this section.

8. For each of the following statements, how would you rate the MINISTRY OF FORESTS in its vegetation management practices?

Response

	Excellent	Good	Needs Considerable Improvement	Poor	No Knowledge Of Issue
a) The Ministry's overall approach to vegetation control	3%	36%	45%	8%	7%
b) The Ministry's performance in establishing weed-free stands	0%	13%	45%	27%	13%
c) The Ministry s degree of care in using herbicides on Crown land	11%	59%	16%	3%	9%
d) The Ministry's consideration of non-chemical options for vegetation control	6%	40%	32%	12%	9%
e) The Ministry's record for using herbicides on reforested areas	4%	44%	24%	7%	18%
f) The Ministry's care in treating Crown range lands with chemical herbicides	3%	37%	12%	3%	41%
g) Ministry officials' level of knowledge about the chemical herbicides used	4%	41%	34%	11%	8%
h) The Ministry's efforts to adequately explain its practices to the public	2%	22%	46%	24%	5%
i) The Ministry's approach to storage and transportation of herbicides	11%	56%	15%	7%	10%
j) The Ministry's standards for safe application of herbicides	14%	62%	14%	2%	7%

10. For each of the following statements, how would you rate the FOREST INDUSTRY in its vegetation management practices?

Response

	Excellent	Good	Needs Considerable Improvement	Poor	No Knowledge Of Issue
a) The Industry's overall approach to vegetation control	1%	17%	38%	23%	19%
b) The Industry's performance in establishing weed-free stands	0%	5%	37%	31%	22%
c) The Industry's degree of care in using herbicides on Crown Land	2%	36%	16%	5%	36%
d) The Industry's consideration of non-chemical options for vegetation control	2%	25%	26%	16%	27%
e) The Industry's record for using herbicides on reforested areas	1%	24%	23%	11%	36%
f) The Industry's care in treating Crown range lands with chemical herbicides	1%	13%	10%	5%	64%
g) Industry officials' level of knowledge about the chemical herbicides used	1%	25%	24%	11%	35%
h) The Industry's efforts to adequately explain its practices to the public	1%	8%	32%	33%	23%
i) The Industry's approach to storage and transportation of herbicides	2%	28%	12%	5%	48%
j) The Industry's standards for safe application of herbicides	3%	32%	13%	4%	43%

Comment (Questions 8 and 10)

- BCFS staff appear to consistently rank the Ministry's performance 5 - 20% better in all categories, than that of industry. However, this difference is most likely the result of respondents' limited knowledge about industry activities in the area of vegetation management.

- While roughly 13% of respondents claimed they had "no knowledge of issue" when asked to rank Ministry performance, 35% were not knowledgeable when it came to ranking industry performance.

- As would be expected, non-technical staff and nursery staff had a much higher number of responses in the "no knowledge of issue" category than management and professional staff. All employee groups demonstrated significantly less knowledge of industry activities, compared with Ministry activities.

- As responses were only obtained from the perspective of Ministry employees, a comparison of the two "agencies" based on the results of this questionnaire is not considered valid. The comments below therefore focus only on issues related to the Ministry's performance in vegetation management (Question 8).

- The ten statements included in question 8 cover a wide variety of topics. The more specific questions on the degree of care and level of standards applied by the BCFS in herbicide use, storage, and transport, appear to have received the most positive response, with the majority of responses falling in the "Good" category (about 60%).

- Some of the more general questions about the consideration of options, historical performance and overall approach to vegetation control tend to hover between "Good" and "Needs Considerable Improvement".

- One of the selections receiving the poorest rating is the ministry's public relations efforts, where 70% of respondents ranked the Ministry's efforts as "Poor" or "Needing Considerable Improvement".

- A similar result occurred in response to the question of the Ministry's performance in establishing weed-free stands, although

written comments indicate that the term "weed-free" may have been taken too literally.

- A difference in knowledge of range issues was evident between regions, with 62% of Region 1 respondents having "no knowledge" of the Ministry's care in using herbicides on crown range land, compared with 25% in Region 2 and 39% in Region 3. In Region 2, 49% ranked the Ministry's performance "Good" while 16% said it needed considerable improvement.

- Variances in opinion were frequent across employee groups, with management and professional staff generally ranking "weed-free" performance, officials' level of knowledge about herbicides and public relations activities lower than average, and ranking herbicide application standards and care in herbicide use higher than average.

9. For any of the above items where you feel the Ministry needs improvement, do you have any suggestions or comments to offer to better the situation?

Themes from Respondents write-in comments

	# of Mentions	% of Total Response (880)
Internal Management Themes		
. Expressed a desire for increased support/ commitment from senior management. Concerned that management not informed/concerned about problems at the field level.	40	5%
Training Themes		
. Need more general training and experience at the operational level. Training beyond the basic pesticide applicators course is required.	83	9%
. Pesticide program should be administered by specialists. Field experience and upgrade courses are essential. Only experts should communicate with the public/media. "A little knowledge can be dangerous."	25	3%

	# of Mentions	% of Total Response (880)
Pesticide Use Themes		
. Concerned about the long term effects of pesticides. Need more research or don't trust the validity of research already done. "Fear of the unknown."	78	9%
. Use organic or manual/mechanical alternatives. Too much emphasis on economics instead of the environment or social benefit. Utilize the unemployed.	67	8%
. Too many constraints on pesticide use - need a better selection of approved chemicals. Regulatory restrictions excessive in comparison with the agricultural sector.	45	5%
Safety Themes		
. Storage and handling facilities inadequate or unsafe. Staff not properly trained in handling pesticides or dealing with emergencies.	59	7%
. Supervision and safety standards adequate but not enforced. Safety is being compromised to save money, especially on contracts.	31	4%
Forest Management Themes		
. Ministry should do more stand tending and survey work. Need more funding.	74	8%
. Improved pre-harvest planning, quicker reforestation, and better plantation maintenance would reduce the need for chemical or mechanical treatments.	48	5%
. Too much emphasis on brush control, mechanical or chemical. Let nature take its course.	12	1%

. Need better record keeping systems and more realistic performance measures.	5	1%

Public Relations Themes

. Increase the level of public information/consultation. Need honest information on the pros and cons of pesticide use. "Be proactive, not reactive." Need training to improve communication skills.	206	23%
. Use professional media campaigns to reach the public. MOF staff are not experienced enough or aggressive enough in public relations.	37	4%

Comments

- The above responses should be reviewed with care since they are the result of individual initiative. It should also be remembered that criticism is more likely to be put into print than praise or satisfaction with the "status quo".

- The outstanding comment by far was an expressed desire for improved public relations. Over 200 respondents made comments to the effect that the BCFS should communicate more honest information to the public and anticipate concerns, not respond to problems. The extent to which this is an expression of a desire to "mould" opinion is unclear, but the overall issue should be addressed.

- Two other prevalent comments include a desire for more training and "hands on" experience, as well as an overall concern over the long term effects of pesticides on health and on the environment.

11. What is your level of concern of discomfort about the various methods of herbicide application as they relate to potential environmental damage?

Response

		Low	Moderate	High	Extreme
Ground Application:	a) backpack	56%	29%	10%	3%
	b) tank sprayer	29%	49%	16%	4%
	c) hack & squirt	74%	18%	4%	1%
	d) spot gun	65%	23%	6%	2%
Aerial Application:	e) fixed wing	7%	24%	44%	23%
	f) helicopter	13%	38%	34%	13%

Comment

- Responses to this question were related directly to the specificity of the application method. The majority of responses ranked ground application methods as having low to moderate potential for environmental damage while aerial applications received a much larger response in the high to extreme categories.

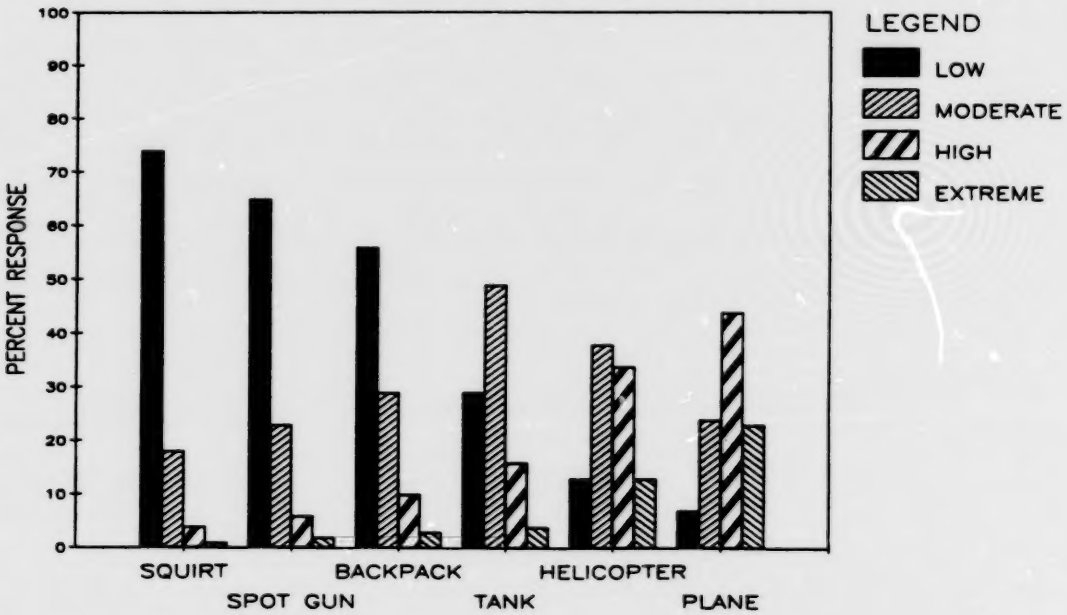
- The results tie in closely with the results of Question 7, in that BCFS employees have definite concerns about the safety of herbicides since they feel that the risks vary with the target and method of application.

- Average regional results did not vary significantly from the provincial average.

- Variances across employee groups were in line with previous trends in that management staff more frequently ranked risks in the low to moderate category, than did non-technical and nursery staff. Professional and technical staff results were close to the provincial average.

BRITISH COLUMBIA FOREST SERVICE
PESTICIDE ATTITUDE SURVEY

Q. 11: WHAT IS YOUR LEVEL OF CONCERN ABOUT VARIOUS APPLICATION METHODS RE: ENVIRONMENTAL DAMAGE?



GENERAL CONCLUSIONS ABOUT FORESTRY MANAGEMENT PRACTICES

This section included four questions concerning the performance of the BCFS and the forest industry in their handling of vegetation control programs.

- Forest Service staff are much less familiar with vegetation management practices in industry, than with government activities.

- The majority consensus is that BCFS standards and care in pesticide use are good, historical performance and the general approach to vegetation management is mediocre, and public relations efforts are poor.

- Employees expressed a desire for an increase in public information and involvement programs, and more training and field experience in pesticide application.

- Employees felt that the risks involved with various pesticide application methods were directly proportional to the specificity of the method.

4.0 SECTION C - PUBLIC INVOLVEMENT

12. Do you feel that the Ministry of Forests should take an active role in involving the public with regard to the use of pesticides in forest management?

Note: From the 8 choices below, respondents were asked to check two responses which best reflected their feelings about the above question.

Response	% of Total Response
Public Involvement	
. YES. If the public is not involved they might suspect that pesticides are being used irresponsibly.	42%
. NO. It's a scientific process, using a federally registered product, and the public should not have to be involved.	4%
Public "Right to Know"	
. YES. The public has a right to know what is being done to their environment.	55%
. NO. You just stir things up and get the public upset when any pesticides are used.	2%
Public education	
. YES. We should take the time to educate the public on pesticide use, even if it slows us down.	64%
. NO. It's too time consuming. The job could be done in half the time it takes to explain it all to the public.	1%

Public Advice on Hazards

- YES. I think that pesticides may be hazardous and the public should be advised about their use. 36%

- NO. If all the legal requirements have been met, there is no need to involve the public. 5%

Comment

- Employees strongly endorsed a policy of active public involvement with regard to the use of pesticides in forest management.

- If "yes" and "no" responses are combined into separate categories and pro-rated to 100% for illustrative purposes, the result is that 96% of respondents agree that the Ministry should take an active role in public involvement. This opinion is reinforced by the large number of comments recorded in Question 9, supporting an increased level of public relations activity.

- Average regional results did not vary significantly from the provincial average.

- Responses varied somewhat between employee groups in the extent of support for each reason in the "yes" or "no" categories, but there were no distinct trends in terms of leaning more toward a "yes" or "no" response.

13. If you were asked to speak to a group of people in support of the Ministry's application of herbicides, how would you rate your personal comfort level?

Response

	Perfectly Comfortable	Quite Comfortable	Somewhat Uncomfortable	Extremely Uncomfortable
a) 2-5 ministry employees	25%	38%	23%	12%
b) 25-50 ministry employees	8%	29%	31%	30%
c) 2-5 members of the public	12%	37%	28%	20%
d) 25-50 members of the public	3%	17%	32%	46%
e) members of the press	2%	17%	30%	49%

Comment

- Some respondents noted that the question appeared to contain two distinctly different themes:
  a) comfort with public speaking; and
  b) comfort with ministry application of herbicides.

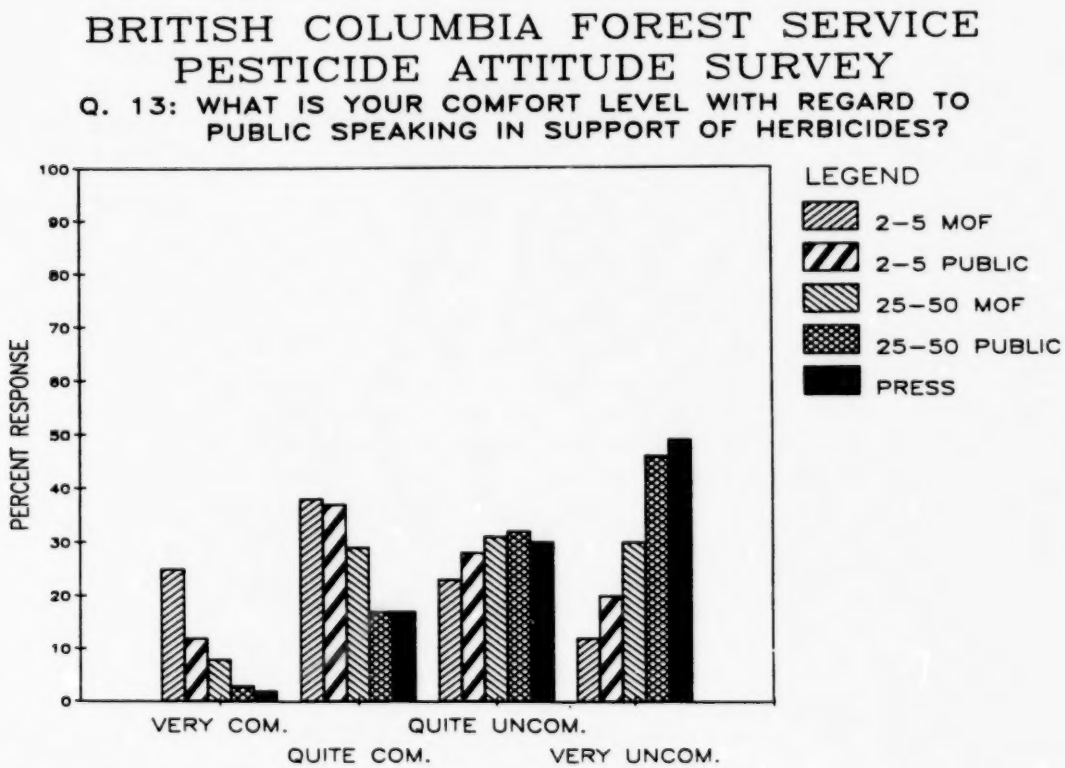
- In analyzing the responses, the public speaking issue appears to have been dominant, since the level of comfort varies directly with the size and type of audience.

- As would be expected, responses range from 63% of respondents being perfectly comfortable or quite comfortable with small groups of ministry employees, to only about 20% being perfectly comfortable or quite comfortable with large public groups or the media.

- Average regional results did not vary significantly from the provincial average.

- Variances across employee groups were reasonably consistent in all regions, in that management and, to a lesser extent, professional staff, were more comfortable with public speaking than average and non-technical staff were less comfortable than average.

- Technical and nursery staff indicated that they were slightly less comfortable than average with speaking to the public and the press, although indications were mixed.



GENERAL CONCLUSIONS ABOUT PUBLIC INVOLVEMENT

This section included two questions about the ministry's role in public involvement and the public speaking ability of employees.

- Employees strongly endorsed a policy of public involvement.

- Employees are much more comfortable speaking about herbicides to small groups of other employees than to large public groups or the media.

5.0 SECTION D - CURRENT CAPABILITY

14. How would you rate the Ministry of Forests for each of the following items?

Response

	Excellent	Good	Needs Considerable Improvement	Poor	No Knowledge Of Issue
a) The Ministry's record for initial training for employees on the use of chemical pesticides.	6%	49%	25%	11%	8%
b) The Ministry's record for upgraded training and refresher courses on the use of chemical pesticides.	4%	37%	35%	13%	10%
c) The availability of printed information on the chemical pesticides being used.	4%	43%	32%	10%	9%
d) The degree of internal management support for the use of chemical pesticides.	3%	38%	31%	10%	15%

Comment

- The Ministry's record for initial training received the most positive response, with 55% of respondents indicating that initial training was excellent or good, compared with only 41% classifying upgraded training as excellent or good.

- This result is in keeping with the expectation that a greater number of employees have been exposed to basic training as opposed to advanced training, and therefore would have greater familiarity with basic training.

- 47% of respondents rated the availability of printed information as being excellent or good and 41% rated the degree of internal management support as being excellent or good. The Ministry fares less well in these areas and employee opinion indicates that current programs should be reviewed.

- The only area where regional results varied significantly from the provincial average was in the degree of internal management support for the use of chemical pesticides. 54% of employees in Region 1 thought that management support was excellent or good while only 30% of employees in Region 2 felt that management support was excellent or good. Region 3 was close to the provincial average of 41%.

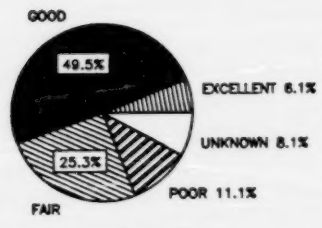
- Management staff in all three regions indicated a greater than average belief that the degree of internal management support for the use of chemical pesticides needs improvement. This comment is presumably directed at the more senior levels of the organization rather than as a critique of their own attitudes. Management staff in general were greater than average in their selection of the "needs considerable improvement" rating.

- A significant percentage of non-technical employees indicated "no knowledge of issue" in all four subject areas. The largest component was in Region 1, where over 50% of the non-technical staff had no knowledge of the issues.

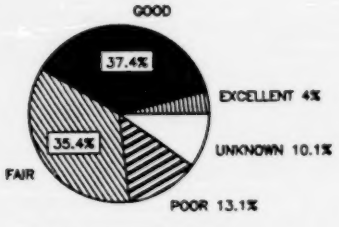
- Technical employees in Region 1 and professional employees in Region 3 showed a greater than average opinion that the Ministry's record for upgraded training and refresher courses needs considerable improvement.

BRITISH COLUMBIA FOREST SERVICE
PESTICIDE ATTITUDE SURVEY

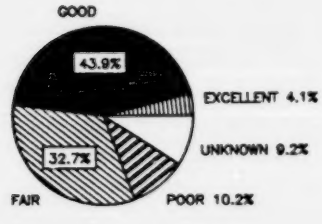
Q.14: HOW WOULD YOU RATE THE MINISTRY OF FORESTS FOR EACH OF THE FOLLOWING?



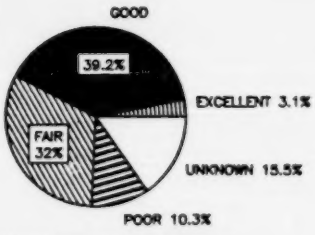
INITIAL PESTICIDE TRAINING



ADVANCED PESTICIDE TRAINING



PRINTED PESTICIDE INFORMATION



MANAGEMENT SUPPORT FOR PESTICIDES

15. How recently have you received formal training in each of the areas listed below?

Response

	Within Past 6 Months	6 - 24 Months Ago	2 - 5 Years Ago	More Than 5 Years Ago	Never
a) The application of chemical pesticides	10%	16%	22%	19%	32%
b) Public speaking	5%	7%	23%	32%	33%
c) Media relations	9%	8%	10%	7%	66%

Comment

- The majority of respondents indicated that they received training in pesticide application and/or public speaking over two years ago, with about one-third having never received training in these areas.

- Media relations training is even more elusive, with 66% of respondents having never received training in this area.

- Average regional results did not vary significantly from the provincial average.

- As may be expected, management staff in all regions generally indicate that they have received more training than average in the application of pesticides and in public speaking, although this training was generally more than five years ago.

- Most professionals also indicate that they received public speaking training over five years ago. Management staff in all regions and professional staff in Region 1 indicate that they have received more training than average, and more recent training, in media relations.

- Nursery staff have received more recent training in pesticide application while non-technical staff have received less than average training in all areas.

16. When was the last time you were required to do each of the following as an employee of the Ministry?

Response

	Within Past 6 Months	6 - 24 Months Ago	2 - 5 Years Ago	More Than 5 Years Ago	Never
a) Apply chemical pesticides	9%	12%	8%	10%	61%
b) Speak to the public regarding the use of pesticides	11%	6%	3%	3%	76%

Comment

. Employee experience both in pesticide application and in public speaking is limited. Variances between employee groups are large enough to reduce the viability of examining provincial averages, with the exception of technical employees whose results closely follow the provincial average.

. With regard to pesticide application:

- About 65% of management staff have never applied pesticides, and of those that have, the majority of the experience occurred over five years prior to the study.

- About 55% of professional staff have never applied pesticides, although of those that have, the majority of their experience was within five years of the study.

- Technical staff experience is similar to that of professionals, while non-technical staff have virtually no actual experience in pesticide application.

- Nursery Technical staff show the greatest experience with pesticides, with about 60% having applied pesticides within the six months prior to the study.

. With regard to public speaking:

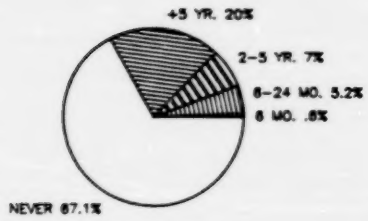
- About 50% of management staff have never spoken to the public about pesticide use, and of those that have the majority of the experience was within two years of the study.

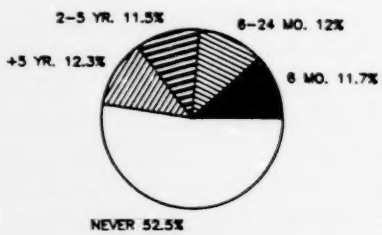
- About 65% of professional staff have never spoken to the public about pesticide use, and of those that have the majority of their experience was within two years of the study.

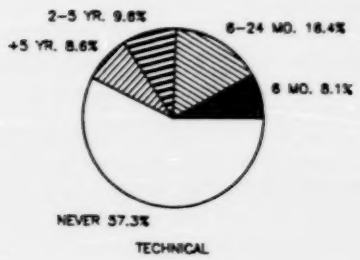
- Technical and nursery staff experience is close to the provincial averages while non-technical staff have virtually no experience in speaking to the public regarding the use of pesticides.

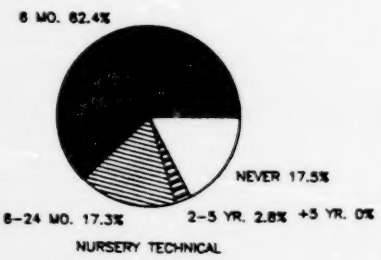
BRITISH COLUMBIA FOREST SERVICE
PESTICIDE ATTITUDE SURVEY

Q. 16: WHEN WAS THE LAST TIME YOU WERE REQUIRED TO APPLY PESTICIDES AS A MINISTRY EMPLOYEE?



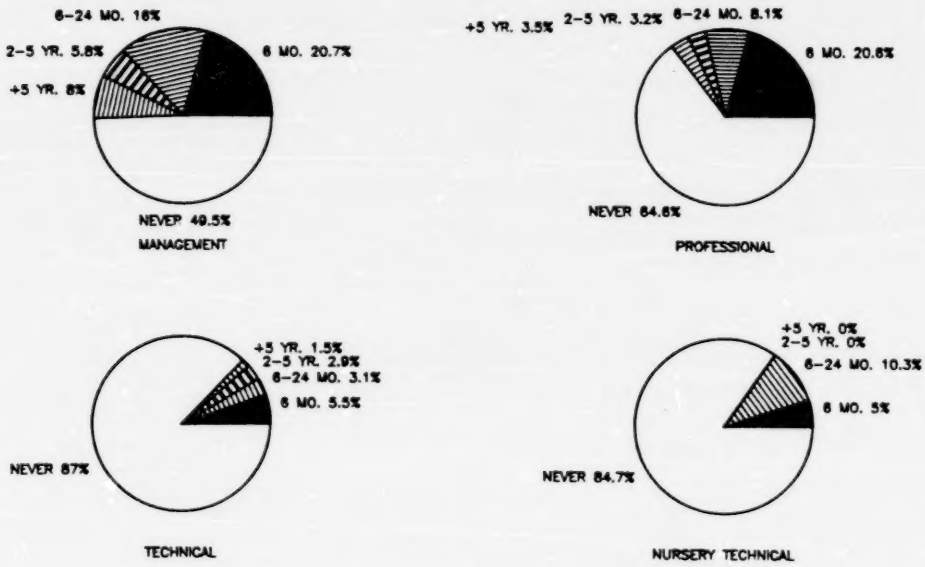






BRITISH COLUMBIA FOREST SERVICE
PESTICIDE ATTITUDE SURVEY

Q. 16: WHEN WAS THE LAST TIME YOU WERE REQUIRED TO SPEAK TO THE PUBLIC REGARDING PESTICIDE USE?



17. General write-in comments on the questionnaire.

Questionnaire Themes	# of Mentions	% of Total Response (880)
1. Expressed appreciation at being asked for input. Feedback would be desirable.	31	4%

	# of Mentions	% of Total Response (880)
Internal Management Themes		
1. Expressed a desire for increased support/commitment from senior management. Concerned that management not informed/concerned about problems at the field level.	46	5%
Training Themes		
1. Pesticide program should be administered by specialists. Field experience and upgrade courses are essential. Only experts should communicate with the public/media. "A little knowledge can be dangerous."	60	7%
2. All employees should receive general training/information on pesticides. Public speaking courses and prepared literature would improve public relations. "Good neighbour philosophy."	51	6%
Pesticide Use Themes		
1. Generally agree with the cautious use of pesticides as a management tool. Benefits probably outweight the costs. Build a program on logic and need, not numerical objectives. Remember the "multiple use" concept.	84	10%
2. Concerned about the long term effects of pesticides. Need more research or don't trust the validity of research already done. "Fear of the unknown."	49	6%
3. Use pesticides only as a last resort.	25	3%

	# of Mentions	% of Total Response (880)
4. Too many constraints on pesticide use. Need a better selection of approved chemicals. Regulatory restrictions excessive in comparison with the agricultural sector.	19	2%
5. Should be more consideration of manual/mechanical silviculture treatments. Too much emphasis on costs and not enough on the environment.	7	1%
6. Absolutely opposed to pesticide use.	5	1%
Safety Themes		
1. Legislation and regulations governing pesticide use are probably adequate but not strictly enforced. Not confident that pesticides are used safely.	14	2%
2. Have faith in product testing and regulations. Pesticides are safe when used properly.	7	1%
Forest Management Themes		
1. Need to improve basic forest management practices. Don't use pesticides as a catch-up/cover-up tool.	25	3%
Public Relations Themes		
1. Increase the level of public information/consultation. Need honest information on the pros and cons of pesticide use. Enlist the support of industry and associations. "Be proactive, not reactive." Need training to improve communication skills.	113	13%
2. Public consultation is time consuming and ineffective. Increase public awareness through professional media campaigns only.	9	1%

COMMENTS

- Most of the themes addressed in the comments at the end of the questionnaire parallel the themes appearing in the responses to Question 9. The only new topic was an expression of appreciation (by 31 respondents) for being asked for their input.

- The issue of public relations was raised again with 113 comments surrounding the need for an increase in public information programs.

- Other frequent comments included 84 regarding the general acceptance of pesticides as a management tool as long as caution and logic prevail, and 60 comments about the specialized nature of pesticides and the concern that it is a field for specialists, not generalists.

GENERAL CONCLUSIONS ABOUT CURRENT CAPABILITY

This section included three questions about the level of pesticide training in the Ministry and employee experience with pesticide application and public speaking.

- Just over half of the respondents rated initial training as good or excellent while less than half rated advanced training, management support, and the availability of printed material as being good or excellent.

- About two-thirds of respondents indicated that they received training in pesticide application and/or public speaking over two years ago, while only one-third have received training in media relations.

- Over one-half of management and professional respondents have never applied pesticides or spoken to the public about pesticide use.

- Over one-half of technical staff have never applied pesticides and over 80% have never spoken to the public about pesticide use.

- Nursery technical staff are the most experienced with pesticides while non-technical staff have had virtually no experience in either pesticide application or public speaking.

6.0 GENERAL CONCLUSIONS OF THE SURVEY

The following general conclusions summarize the attitudes of Forest Service employees with regard to pesticide use:

PERSONAL ATTITUDES

- About half of the respondents are regular or occasional users of herbicides and insecticides. Very few respondents use other forms of pesticides.

- A significant number of respondents feel that all listed food products contain amounts of pesticide residues when bought from grocery chains. Fewer respondents feel that food purchased at farmers' markets, health food stores, or grown at home contain residues.

- Write-in comments indicate concern about accumulated effects of pesticides, but that products are generally considered safe if washed properly.

- Write-in comments also express some concern over the control of pesticide application on food products.

- About half the respondents feel that regulations for pesticide use on agricultural lands are adequate for public safety, but 79% felt comfortable with the regulations for use on forest lands. On the other hand, regulations for lawns and gardens were felt to be somewhat inadequate by 58% of the respondents.

- When used according to labelled instructions, a majority of respondents felt that pesticides could be used "with special care" in forests, or agricultural croplands, or private lawns and gardens, and in commercial nurseries. Respondents were less comfortable about their use in parks, game reserves, household plants, and home vegetables. In rivers and lakes, a majority felt that pesticides should not be used or, if used, only when absolutely necessary.

FORESTRY MANAGEMENT PRACTICES

- In general, respondents felt that vegetation management practices ranged from "needs improvement" to "good". Significant "poor" responses occurred with respect to the ministry's performance in establishing weed-free stands and its efforts to adequately explain its forestry management practices to the public.

- Respondents felt that the Ministry's performance in most areas of vegetation management was better than that of the forest industry. But this view might be tempered by respondents' relative lack of exposure to industry practice.

- Write-in comments expressed the following:
  - a desire for increased support and commitment from senior management;
  - the need for more general training at the operational level, beyond basic training in applications;
  - some concern about the long-term effects of pesticides and a lack of trust in the validity of existing research;
  - lack of adequate storage and handling facilities;
  - lack of adequate funding for stand tending and surveys;
  - the need for the ministry to increase the level of public information and consultation about pesticide use.

- With regard to application, 67% of respondents consider aerial spraying to create high or extreme environmental damage. Only low or moderate concern arose from the use of most other methods.

PUBLIC INVOLVEMENT

- Respondents feel that:
  - the public should be more directly involved in pesticide issues;
  - the public has a right to know what is being done to their environment;
  - the ministry should take the time and effort to educate the public on pesticide use, even if it slows down ministry activities; and
  - the public should be advised about pesticide use even if all the legal requirements are met.

- Respondents are not generally comfortable about explaining the case for herbicides to the public. However, it is not clear whether this is because they are reluctant to support the Ministry's viewpoint, they are unfamiliar with the issues involved, or are inexperienced in public speaking.

CURRENT CAPABILITY

- Just over half of respondents feel that the ministry's capability in initial training in the use of pesticides is excellent or good; but its record for upgraded training and refresher courses needs improvement.

- Less than one half of respondents believe that the availability of printed information and the degree of management support for the use of pesticides is generally excellent or good.

- About one half of respondents have received training in pesticide application in the past five years. However, only 29% have actually applied pesticides in the same period.

- One third of respondents have never received training in public speaking, and only 12% have received training in the past two years. Two thirds of respondents have never received training in media relations. Only 17% have received training in the past two years.

- On the other hand, only 17% have actually had to speak to the public about the use of pesticides in the last two years. While training and experience in public speaking and media relations is not extensive, it is possible that those who most frequently need it possess it.

ADDITIONAL GENERAL COMMENTS

- In addition to the issues already noted, write-in comments from respondents suggest the views that:
  - all employees should participate in general training on pesticide use;
  - only those with specific expertise should communicate directly with the media;
  - public speaking courses and prepared literature would be useful to help other employees discuss pesticide use intelligently and confidently with members of the public.

- As a forest management option, the benefits from the cautious use of pesticides outweigh the costs.

- Legislation and regulations governing pesticide use are felt to be adequate, but not strictly enforced.

- The ministry's public relations activity should be strengthened by the dissemination of honest information about the pros and cons of pesticide use. A proactive stance is recommended, employing greater use of professional media campaigns.

PRICE WATERHOUSE MANAGEMENT CONSULTANTS
April, 1987